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ABSTRACT

This booklet is intended to provide information on the snakes of South Carolina, to point out the necessary steps to avoid a snakebite, and to indicate the current medical treatment for poisonous snakebite. It includes a checklist of South Carolina reptiles and a taxonomic key for the identification of snakes in the Savannah River Plant. Three families of snakes from the region are described in detail with numerous examples and some photographs included. Common names and scientific names are used. Factors involved in poisonous snakebite present a person's chances of being bitten by a poisonous snake and what procedures to follow if this should happen. Selected references are provided at the end of the booklet. (MA)

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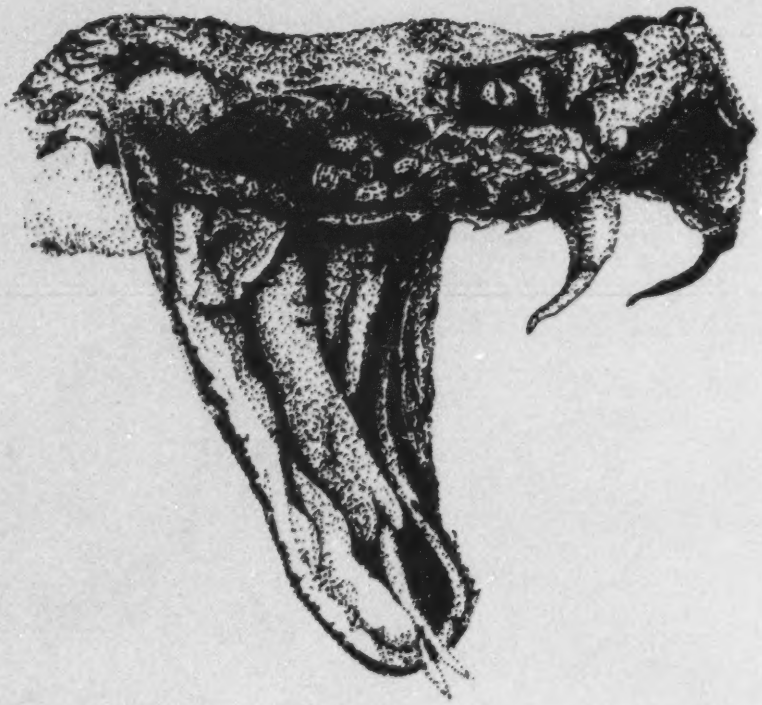
by

Whit Gibbons

Savannah River Ecology Laboratory

Aiken, South Carolina



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A PUBLICATION OF ERDA'S SAVANNAH RIVER NATIONAL ENVIRONMENTAL RESEARCH PARK

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INTRODUCTION

The present-day emphasis on ecology has brought us to the realization that each plant and animal species has some role in man's total environment. No matter how insignificant, each species has at least a potential effect on our existence. Snakes not only have an indirect ecological effect, but they may also have a most direct impact on man. The effect may be physiological as a result of poisonous snakebite, or it may be psychological as a consequence of the almost universal fear and misunderstanding that people have of snakes. The severity of both the physiological and psychological potential can be diminished with some knowledge of the ecology and behavior of the snakes found in one's own geographic region. Snakes are one of the most poorly understood of the major animal groups.

Although 38 species of snakes occur in South Carolina, the general ecology of even the most common is, for the most part, unknown. This lack of knowledge applies to the 6 poisonous species as well as to the 32 harmless varieties. Furthermore, the consequences of being injected by snake venom are generally unknown by laymen and, unfortunately, are still poorly understood by scientists and medical doctors. Therefore, we have a dilemma. In our state, we have an important, frequently encountered assortment of animals, some of which may be highly dangerous. Yet we know far less than we should about their ecology or their potential poisonous effects.

The purpose of this booklet is to point out what we know and what we do not know (but should know) about the snakes of South Carolina with emphasis on those found on the Savannah River Plant (SRP) (FIG 1). Hopefully, sufficient information is given to alleviate unnecessary fears concerning the many species of nonpoisonous snakes. This booklet should provide the reader with a familiarity, understanding, and even an appreciation of significant facets of South Carolina wildlife. A second intent is to point out the necessary steps for avoidance of poisonous snakebite and to indicate the current medical recommendations for emergency treatment should it ever be needed.

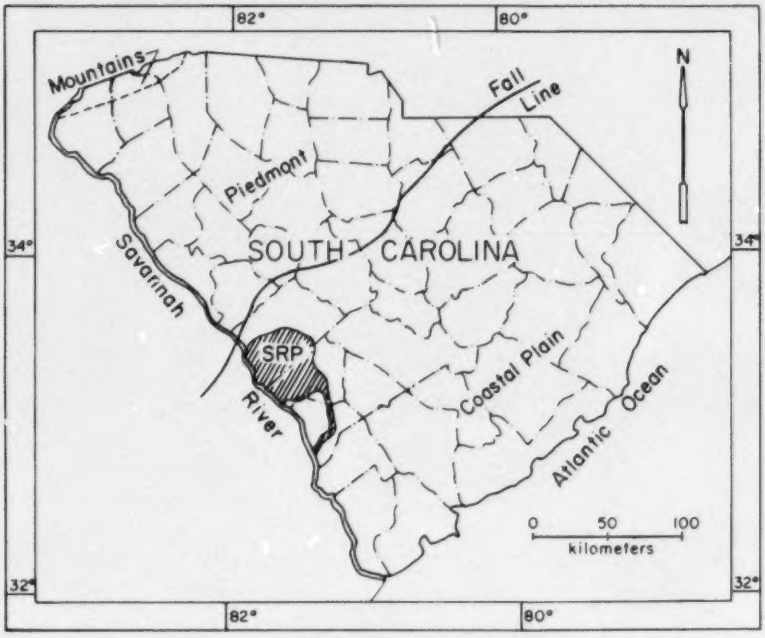


FIG 1. *Location of the Savannah River Plant (SRP) within the state of South Carolina. With the exception of the extreme northwestern portion, South Carolina is divisible into two major physiographic regions which are geologically and herpetologically distinct. One of these, known as the Piedmont Plateau, includes roughly the northwestern half of the state. The southeastern half of South Carolina and all of the SRP fall within the Atlantic Coastal Plain province. The transition zone between the two geologic provinces is known as the Fall Line. The Fall Line serves as a faunal boundary between numerous species and subspecies of reptiles and amphibians. For this reason many of the SRP snakes are represented by southern species and subspecies rather than the northern ones characteristically found in the piedmont and mountain regions.*

CHECKLIST OF SOUTH CAROLINA REPTILES

Snakes, lizards, turtles, and crocodilians are the major living representatives of the class Reptilia, and are distinct from the other vertebrates — fishes, amphibians, birds, and mammals. Table 1 shows all reptile species which are known to occur in South Carolina. Snakes constitute more than half of the reptile species in the state. Common names often vary locally; consequently, the use of scientific names provides a stability to the nomenclature and also indicates, in some instances, the degree of relatedness. For example, the canebrake and timber rattlesnake are only regional variants (or subspecies) of the same species (*Crotalus horridus*) whereas the eastern diamondback (*Crotalus adamanteus*) is an altogether different species. Further, the pygmy rattlesnake belongs to a separate genus (*Sistrurus*) and therefore is less closely related to other rattlesnake (*Crotalus*) than the copperhead (*Agkistrodon contortrix*) and cottonmouth (*Agkistrodon piscivorus*) are to each other.

Scientific names occasionally change through advancement in our understanding of evolutionary relationships and as a result of taxonomic interpretations. Therefore, as opinion enters into nomenclatural decisions, consistency of names can become a problem. To confuse the issue as little as possible, the common and scientific names (including subspecies designations) used in this presentation will be those used by Conant.[1] This publication is probably the most widely used and up-to-date publication on reptiles and amphibians of the eastern United States currently available.

RECOGNITION OF SOUTH CAROLINA SNAKES

Identification is a problem with any group of plants or animals. However, with snakes the consequences of being wrong can sometimes be extremely serious. Of the six venomous species in South Carolina, five occur on the SRP and most have look-alikes among the harmless ranks. Among the nonpoisonous forms, some are distinctive enough in color and pattern to make recognition easy. But only through experience, not books, can one learn to make spot identifications of most species.

In order to present a comprehensive picture of the snake species in South Carolina, a system of classification is necessary. This can be effectively accomplished by following the accepted scientific scheme of family, genus, and species, as presented in Table 1. A particular snake can be identified by means of the key in Table 2. Species present on the SRP are indicated by an asterisk. The intent of pages 10-19 is to note the commonness or rarity, the general habitat, and the geographic range of each species found in South Carolina.

Classifying a species in regard to its abundance or rarity is an age-old problem that is never resolved with total satisfaction. For present purposes, each species will be designated on the basis of the scheme indicated below. Subjectivity will creep into the category assignment of many of the species. Thus, a species denoted as "uncommon" may indeed seem to warrant "abundant" status to someone else merely because of a different exposure through personal field experiences.

The following terminology will be used in assignment to abundance categories:

Abundant. Species is seen so frequently or can be found with such assurance that the absence of specimens in appropriate seasons and locations would be cause for question.

Common. Species is no surprise when encountered, but the absence of specimens in certain locations or for long periods of time is considered inconsequential.

Uncommon. Species is noteworthy when found and is usually represented by single specimens.

Rare. Species is seen so seldom that question can usually be raised as to whether sizable populations actually exist.

Locally. This term indicates that the species occurs in concentration pockets with gaps in between; the abundance designation indicates the commonness within such pockets.

1. R. Conant. *A Field Guide to Reptiles and Amphibians of Eastern and Central North America.* 2nd edition. Houghton Mifflin Co., Boston, Massachusetts. (1975).

TABLE 1. Reptiles of South Carolina. Species found on the Savannah River Plant are indicated by an asterisk.

CLASS REPTILIA

Order Crocodilia – Crocodilians	
Family Alligatoridae – Alligators	
**Alligator mississippiensis*	American Alligator
Order Testudines – Turtles	
Family Chelydridae	
**Chelydra serpentina serpentina*	Snapping Turtle
Family Kinosternidae	
**Sternotherus odoratus*	Stinkpot
**Kinosternon subrubrum subrubrum*	Eastern Mud Turtle
Family Emydidae	
**Clemmys guttata*	Spotted Turtle
**Terrapene carolina carolina*	Eastern Box Turtle
Chrysemys picta picta	Eastern Painted Turtle
**Chrysemys scripta scripta*	Yellow-bellied Turtle
**Chrysemys concinna concinna*	River Cooter
**Chrysemys floridana floridana*	Florida Cooter
**Deirochelys reticularia reticularia*	Chicken Turtle
Malaclemys terrapin centrata	Carolina Diamondback Terrapin
Family Testudinidae	
Gopherus polyphemus	Gopher Tortoise
Family Trionychidae	
**Trionyx spiniferus asperus*	Gulf Coast Spiny Softshell
Trionyx ferox	Florida Softshell
Family Cheloniidae	
Chelonia mydas mydas	Atlantic Green Turtle
Eretmochelys imbricata imbricata	Atlantic Hawksbill
Caretta caretta caretta	Atlantic Loggerhead
Lepidochelys kempi	Atlantic Ridley
Family Dermochelyidae	
Dermochelys coriacea coriacea	Atlantic Leatherback
Order Squamata – Snakes and Lizards	
Suborder Lacertilia – Lizards	
Family Iguanidae	
**Anolis carolinensis*	Green Anole
**Sceloporus undulatus undulatus*	Southern Fence Lizard
Sceloporus undulatus hyacinthinus	Northern Fence Lizard
Phrynosoma cornutum[1]	Texas Horned Lizard
Family Teiidae	
**Cnemidophorus sexlineatus sexlineatus*	Six-Lined Racerunner
Family Scincidae	
**Scincella laterale*	Ground Skink
**Eumeces fasciatus*	Five-Lined Skink
**Eumeces laticeps*	Broad-Headed Skink
**Eumeces inexpectatus*	Southeastern Five-Lined Skink
Family Anguidae	
**Ophisaurus ventralis*	Eastern Glass Lizard
**Ophisaurus attenuatus longicaudus*	Eastern Slender Glass Lizard
Ophisaurus compressus	Island Glass Lizard
Suborder Serpentes – Snakes	
Family Colubridae	
**Natrix cyclopion floridana*	Florida Green Water Snake
**Natrix taxispilota*	Brown Water Snake
**Natrix erythrogaster erythrogaster*	Red-Bellied Water Snake
**Natrix fasciata fasciata*	Banded Water Snake
**Natrix rigida rigida*	Eastern Glossy Snake
Natrix sipedon pleuralis	Midland Water Snake
Natrix septemvittata	Queen Snake
**Seminatrix pygaea paludis*	Carolina Swamp Snake
**Storeria dekayi dekayi*	Northern Brown Snake
Storeria dekayi wrightorum	Midland Brown Snake
**Storeria occipitomaculata occipitomaculata*	Red-Bellied Snake
**Thamnophis sirtalis sirtalis*	Eastern Garter Snake
**Thamnophis sauritus sauritus*	Eastern Ribbon Snake
Thamnophis sauritus sackeni	Peninsula Ribbon Snake
**Virginia valeriae valeriae*	Eastern Earth Snake
[3]*Virginia striatula*	Rough Earth Snake
**Heterodon platyrhinos*	Eastern Hognose Snake
**Heterodon simus*	Southern Hognose Snake
**Diadophis punctatus punctatus*	Southern Ringneck Snake
[3]*Carphophis amoenus amoenus*	Eastern Worm Snake
Rhadinaea flavilata	Pine Woods Snake
**Farancia abacura abacura*	Eastern Mud Snake
**Farancia erytrogramma erytrogramma*	Rainbow Snake
**Coluber constrictor priapus*	Southern Black Racer
Coluber constrictor constrictor	Northern Black Racer
**Masticophis flagellum flagellum*	Eastern Coachwhip
**Opheodrys aestivus*	Rough Green Snake
**Elaphe guttata guttata*	Corn Snake
**Elaphe obsoleta obsoleta*	Black Rat Snake
Elaphe obsoleta quadrivittata	Yellow Rat Snake
**Pituophis melanoleucus melanoleucus*	Northern Pine Snake
Pituophis melanoleucus mugitus	Florida Pine Snake
**Lampropeltis getulus getulus*	Eastern Kingsnake
**Lampropeltis triangulum elapsoides*	Scarlet Kingsnake
Lampropeltis triangulum triangulum	Eastern Milk Snake
[3]*Lampropeltis calligaster rhombomaculata*	Mole Snake
**Cemophora coccinea copei*	Northern Scarlet Snake
**Tantilla coronata*	Southeastern Crowned Snake
[2]*Dymarchon corais couperi*	Eastern Indigo Snake
Family Elapidae	
**Micrurus fulvius fulvius*	Eastern Coral Snake
Family Viperidae	
**Agkistrodon c. contortrix*	Southern Copperhead
Agkistrodon contortrix mokasen	Northern Copperhead
**Agkistrodon piscivorus piscivorus*	Eastern Cottonmouth
**Sistrurus miliarius miliarius*	Carolina Pygmy Rattlesnake
Sistrurus miliarius barbouri	Dusky Pygmy Rattlesnake
**Crotalus horridus atricaudatus*	Canebrake Rattlesnake
Crotalus horridus horridus	Timber Rattlesnake
Crotalus adamanteus	Eastern Diamondback Rattlesnake

1. The Texas Horned Lizard has been introduced in some areas of South Carolina; populations persist on Isle of Palms and on Sullivan's Island near Charleston, South Carolina
2. The Eastern Indigo Snake was reported in the early 1900's from Charleston, South Carolina but no recent records exist.
3. Species not reported from SRP but range encompasses site.

TABLE 2. Identification of SRP Snakes

The following taxonomic key is designed to determine the proper species of a hand-held specimen (dead or alive). To effectively use the key, an individual must be familiar with the anatomical features of snakes. A word of caution: Variation in appearance occurs among the individuals of all species of animals; snakes are no exception; therefore, the following key should be used with the understanding that scale characters and color patterns vary to an extent that a small proportion of individuals of some species cannot be satisfactorily identified with the key. An obvious example of variation that would hinder identification is albinism. Although this phenomenon is exceedingly rare, any species of snake could have an albino individual. Possible variations in appearance will not be mentioned for a species unless they occur frequently in SRP specimens.

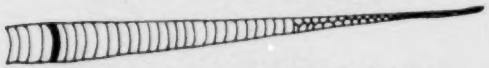
Use of the Key

A taxonomic key is designed to permit identification of an animal by systematic selection of sets of characteristics that fit the particular specimen. In the following key, the characteristics are presented in numbered couplets. One of the pair (a or b) can be rejected as not applicable to the specimen whereas the other will be.

To use the key, begin with couplet number 1 and select the description (1a or 1b) which fits the specimen. Then proceed to the next couplet, as indicated at the end of the appropriate description. Instructions for proceeding to another couplet are indicated at the end of each description.

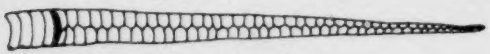
Follow the process of selection and elimination until the description is terminated by a species name.

1a. Pit between eye and nostril (see photo, p 23); most scales on underside of tail in a single row

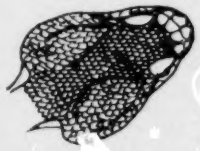


. . . Pit vipers (Crotalidae) – POISONOUS . . . Go to 2

1b. No pit between eye and nostril; scales on underside of tail in double row . . . Go to 5



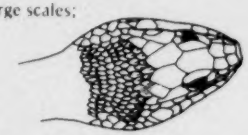
2a. Top of head with many small scales;



rattles or button on tail;

last few inches of tail velvety black; basic color gray with black, chevron-like bands across back; pinkish to yellow stripes down center of back. . . Canebrake Rattlesnake (*C. horridus*) – POISONOUS

2b. Top of head with large scales;



rattles may be present . . . Go to 3

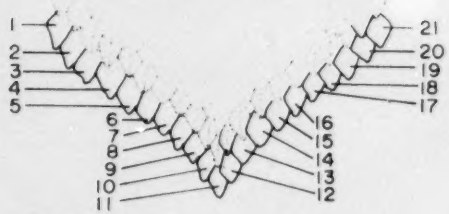
3a. Rattles (or button) on tail; size small, seldom exceeding 2 ft; basic color gray with dark blotches along back and sides . . . Carolina Pygmy Rattlesnake (*S. miliarius*).

3b. No rattles; basic color brown or reddish . . . Go to 4

4a. Dorsal scale rows 23 at midbody; basic color light brown or reddish with darker crossbands along body . . . Southern copperhead (*A. contortrix*) – POISONOUS

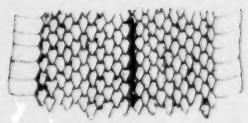
Dorsal scale rows in snakes may vary considerably, depending upon the species; to obtain the number at midbody, count as indicated; midbody counts usually result in uneven numbers.

Method of counting scale rows

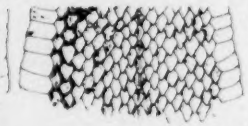


EXAMPLES

23 Scale Rows



19 Scale Rows

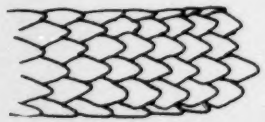


4b. Dorsal scale rows 25 at midbody; basic color brown in specimens over 18 inches long; sometimes reddish with crossbands in smaller specimens . . . Eastern cottonmouth (*A. piscivorous*) – POISONOUS

5a. Scale rows at midbody 15-19 . . . Go to 6

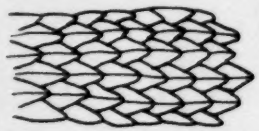
5b. Scale rows at midbody 21 or more . . . Go to 23

6a. All scales smooth



Go to 7

6b. Most scales distinctly keeled with ridge down center



Go to 18

7a. Basic color solid black or solid light brown above, except for head and neck region in some instances . . . Go to 8

7b. Not solidly black or brown above; with some form of markings on back (blotches, rings, stripes) or with basic color grading from black head to light brown tail . . . Go to 13

8a. Basic color light brown; length seldom exceeding 1 ft . . . Go to 9

8b. Basic color black . . . Go to 10

9a. Head black; black ring around neck . . . Southeastern Crowned Snake (*T. coronata*)

9b. Body uniform brown above from head to tail . . . Smooth Earth Snake (*V. valeriae*)

10a. Shiny black above; gray belly; white chin; no red or yellow color on any part of body . . . Black Racer (*C. constrictor*)

10b. Black above; belly yellow, orange or red . . . Go to 11

11a. Dull black above; yellow ring around neck; yellow or orange belly with black spots; length seldom exceeding 2 ft . . . Southern Ringneck Snake (*D. punctatus*)

11b. Uniform black above from snout to tail; belly with red or orange . . . Go to 12

12a. Belly solid orange or red; length seldom exceeding 18 inches . . . Black Swamp Snake (*S. pygaea*)

12b. Belly checkerboard in appearance with alternating bright red and black . . . Eastern Mud Snake (*F. abacura*)

13a. Body markings including red, orange, or yellow . . . Go to 14

13b. Body markings not including red, orange or yellow . . . Go to 16

14a. Body shiny black above with thin red stripes; belly red, orange or yellow with black spots . . . Rainbow Snake (*F. erytrogramma*)

14b. Body with transverse bands or rings of red, black and yellow or white . . . Go to 15

15a. Body rings continuing across belly, encircling body; nose black . . . Eastern Coral Snake (*M. fulvius*) — POISONOUS

15b. Belly white or gray; nose red . . . Scarlet Snake (*C. coccinea*)

16a. Head and front half of body velvety black; posterior half of body brown . . . Eastern Coachwhip (*M. flagellum*)

16b. Head not black; length usually not exceeding 18 inches . . . Go to 17

17a. Row of dark gray or brownish blotches down back; small dark spots on sides and belly . . . juvenile Black Racer (*C. constrictor*)

17b. Light brown or tan above with thin dark crossbands; eyes noticeably larger than other snakes . . . juvenile Eastern Coachwhip (*M. flagellum*)

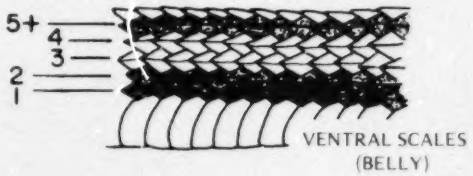
18a. Body solid green above; belly yellow . . . Green Snake (*O. aestivus*)

18b. Body not solid green above . . . Go to 19

19a. Three light yellow or greenish stripes down center of back and sides; belly yellowish . . . Go to 20

19b. Body black or brownish above without yellow stripes . . . Go to 21

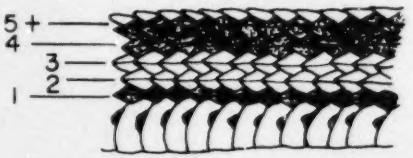
20a. Side stripes confined to scale rows 3 and 4 on each side



Lip scales; yellowish without dark markings

. . . Eastern Ribbon Snake (*T. sauritus*)

20b. Side stripes confined to scale rows 2 and 3; on each side



Lip scales interspersed by dark markings

Eastern Garter Snake (*T. sirtalis*)

21a. Body black or dark brown above; belly white or yellowish with 2 dark stripes or rows of dots; scale rows 19 . . . Glossy Water Snake (*N. rigida*)

21b. Body dark or light brown above, belly red or light-colored without stripes; scale rows 15 or 17 . . . Go to 22

22a. Belly dark red; scale rows 15 . . . Red-bellied snake (*S. occipitomaculata*)

22b. Belly grayish; scale rows 17 . . . Brown Snake (*S. dekayi*)

23a. All scales smooth; color pattern includes yellow rings encircling body . . . Go to 24

23b. Color dark or patterned with bands or blotches but not with yellow crossbands or rings; some scales keeled (weakly keeled only on sides in some forms) . . . Go to 25

24a. Body completely encircled by red, yellow and black rings; length seldom exceeding 2 ft . . . Scarlet Kingsnake (*L. triangulum*)

24b. Body shiny black with yellow rings or crossbands; no red present . . . Eastern Kingsnake (*L. getulus*)

25a. Basic color light gray above with dark blotches; head always grayish; entire belly and underside of tail white with no markings . . . Eastern Pine Snake (*P. melanoleucus*)

25b. Basic color patterns darker than light gray; parts of underside dark or patterned . . . Go to 26

26a. Rostral scale (at tip of nose) distinctly pointed or upturned

. . . Go to 27

26b. Rostral scale rounded . . .

Go to 28

27a. Underside of tail darker than, or same shade as, belly; always patterned above with dark blotches on light tan or brownish body; length seldom exceeding 18 inches . . . Southern Hognose Snake (*H. simus*)

27b. Underside of tail noticeably lighter in color than belly; may be patterned above or may be black . . . Eastern Hognose Snake (*H. platyrhinos*)

28a. Scales along center of back weakly keeled or smooth; scales feel smooth when rubbed transversely . . . Go to 29

28b. Scales strongly keeled; scales are noticeably keeled when rubbed transversely . . . Go to 30

29a Basic pattern of blotching primarily orange and red; belly black and white checkerboard pattern; light colored stripes form a "V" on top of head . . . Corn Snake (*E. guttata*)

29b. Basic pattern of blotching primarily gray or brown; no "V" on top of head . . . Black Rat Snake (*E. obsoleta*)

30a. Scale rows 27-33; belly plain white or yellow or with brown markings . . . Go to 31

30b. Scale rows 23-25; belly solid red or with extensive brown and reddish markings . . . Go to 32

31a. Basic color brown with darker brown or black squares on the back and sides; belly with brown markings . . . Brown Water Snake (*N. taxispilota*)

31b. Basic color dark gray or olive above; sometimes with lighter mottling but no distinct pattern; belly gray or yellowish and unmarked except under tail . . . Green Water Snake (*N. cyclopion*)

32a. Black or dark gray above; solid color with no pattern in adults; dark blotches apparent on back and sides of juveniles (less than 18 inches in length); belly usually solid orange or pink and always without markings . . . Red-bellied Water Snake (*N. erythrogaster*)

32b. Series of reddish and brown crossbands above; belly yellowish with reddish or brown markings . . . Banded Water Snake (*N. fasciata*)

TABLE 3. Quick Identification Characters for SRP Snakes

The following categorization scheme is designed to allow rapid identification of many (but not all) of the local snakes. The detailed taxonomic key in Table 3 and the species accounts in the text should be used to confirm species identifications.

Category	Characteristic	Possible Species
Size	Total length exceeds 4 feet	Eastern Mud Snake Rainbow Snake Southern Black Racer Eastern Coachwhip Eastern Kingsnake Corn Snake Black Rat Snake Florida Green Water Snake Red-Bellied Water Snake Banded Water Snake Brown Water Snake Florida Pine Snake Eastern Cottonmouth – POISONOUS Southern Copperhead – POISONOUS Canebrake Rattlesnake – POISONOUS
	Total length exceeds 2 feet	(Any of those above) Scarlet Kingsnake Eastern Ribbon Snake Eastern Garter Snake Rough Green Snake Eastern Hognose Snake Eastern Coral Snake – POISONOUS
	Total length less than 6 inches (all of these species get larger, but specimens of other species are never this small)	Carolina Swamp Snake Eastern Earth Snake Southern Ringneck Snake Northern Scarlet Snake Southeastern Crowned Snake Eastern Glossy Snake Northern Brown Snake Red-Bellied Snake Rough Green Snake Scarlet Kingsnake Eastern Hognose Snake Southern Hognose Snake Carolina Pygmy Rattlesnake – POISONOUS Eastern Coral Snake POISONOUS
Color	Solid green above	Rough Green Snake
	Shiny black above; no markings	Carolina Swamp Snake Eastern Mud Snake Southern Black Racer Eastern Glossy Snake Red-Bellied Snake Eastern Hognose Snake
	Dull black, dark gray, or dark brown above (obscure pattern visible on some)	Black Rat Snake Red-Bellied Snake Eastern Garter Snake Florida Green Water Snake Red-Bellied Water Snake Banded Water Snake Eastern Hognose Snake Brown Water Snake Eastern Cottonmouth – POISONOUS
	Bright yellow markings on some portion body	Eastern Mud Snake Eastern Hognose Snake Rough Green Snake Scarlet Kingsnake Eastern Ribbon Snake Eastern Garter Snake Southern Ringneck Snake Rainbow Snake Northern Scarlet Snake Eastern Kingsnake Eastern Coral Snake – POISONOUS Canebrake Rattlesnake – POISONOUS
	Bright red or orange present on belly, with or without other marking	Carolina Swamp Snake Southern Ringneck Snake Eastern Mud Snake Rainbow Snake Scarlet Kingsnake Red-Bellied Snake Red-Bellied Water Snake Banded Water Snake Eastern Coral Snake - POISONOUS
	Light brown or tan above (excluding head and neck region) without blotches	Eastern Earth Snake Southeastern Crowned Snake Northern Brown Snake Red-Bellied Snake Eastern Coachwhip (juvenile)
Behavior	Vibrates tail when startled or disturbed	Northern Pine Snake Southern Black Racer Eastern Coachwhip Eastern Kingsnake Scarlet Kingsnake Corn Snake Black Rat Snake Eastern Hognose Snake Eastern Cottonmouth – POISONOUS Southern Copperhead – POISONOUS Carolina Pygmy Rattlesnake – POISONOUS Canebrake Rattlesnake – POISONOUS
	Basks or sleeps on branches over water	Southern Black Racer Eastern Kingsnake Corn Snake Black Rat Snake Eastern Ribbon Snake Eastern Garter Snake Rough Green Snake Florida Green Water Snake Red-Bellied Water Snake Banded Water Snake Brown Water Snake Eastern Cottonmouth – POISONOUS Southern Copperhead – POISONOUS
	May bite when first captured	Southern Black Racer Eastern Coachwhip Eastern Kingsnake Scarlet Kingsnake Corn Snake Black Rat Snake Eastern Glossy Snake Eastern Ribbon Snake Eastern Garter Snake Rough Green Snake Florida Green Water Snake Red-Bellied Water Snake Banded Water Snake Brown Water Snake Eastern Cottonmouth – POISONOUS Southern Copperhead – POISONOUS Carolina Pygmy Rattlesnake – POISONOUS Canebrake Rattlesnake – POISONOUS Eastern Coral Snake – POISONOUS

FAMILY COLUBRIDAE – ALL NON–POISONOUS

***FLORIDA GREEN WATER SNAKE** – *Natrix cyclopion floridana*

Locally abundant. This species is found in most types of aquatic habitats, although frequently it may be totally absent from an area. It has been reported to enter brackish water habitats along the coast. It is heavy-bodied and often more than 3 ft long; dorsal color is nondescript gray or greenish-brown. Found in the southern one-third of the state.

***BROWN WATER SNAKE** – *Natrix taxispilota*

Locally abundant. This species is associated with stream, river, and swamp environments. It often attains a length over 4 ft; it is light brown dorsally with darker squares on back and sides. Found in the southeastern two-thirds of the state.

***RED-BELLIED WATER SNAKE** – *Natrix e. erythrogaster*

Locally common. This species is usually associated with aquatic environments of all types, but it is occasionally encountered several hundred feet away from permanent water. Its back is uniform dull black, dark gray, or brownish, and its belly is light red or orange. Found in the southeastern two-thirds of the state.

***BANDED WATER SNAKE** – *Natrix f. fasciata*

Abundant. This is the most ubiquitous species of *Natrix* and is found in all aquatic habitats, permanent or temporary. It enters brackish water areas and salt marshes. It is usually heavy-bodied and often more than 3 ft long. Its color is variable but usually dark brown or reddish with crossbands. Found in the southeastern half of the state.

***GLOSSY WATER SNAKE** – *Natrix r. rigida*

Rare. This species is primarily associated with non-flowing aquatic habitats. It seldom reaches a length of 2 ft. It is shiny brown on back, and its belly is light yellow or whitish with two dark stripes (or rows of spots). Found in the southeastern half of the state.

MIDLAND WATER SNAKE – *Natrix sipedon pleuralis*

Abundant. This species is found in most types of aquatic habitats and is often the only species of water snake where it occurs in South Carolina. It is similar in size and appearance to banded water snake. Found in the northwestern half of the state.

QUEEN SNAKE – *Natrix septemvittata*

Locally common. This species is most frequently associated with running water habitats, particularly small creeks. It seldom reaches a length of more than 2 ft. It is brown on top, and its underside is light yellow with four dark stripes. Found in the northwestern half of the state.

***CAROLINA SWAMP SNAKE** – *Seminatrix pygaea paludis*

Locally uncommon. This species is presumably restricted to clean, heavily vegetated aquatic areas, cypress swamps, and associated habitats. Adults are usually little more than 1 ft long and are shiny black above with a bright red belly. Found in the southern half of the state.

Female Carolina Swamp Snake With Young – Thought to be rare on the SRP, this species was recently revealed to be exceptionally abundant by the capture of more than 80 individuals in sunken pitfall traps around a small lake. A variety of harmless species of snakes such as these occur on the SRP. As a group these may be artificially lumped as small, nonbiting, secretive, frequently nondescript species. Such species are often locally abundant although their commonness may not be apparent. The following species fall into this group:

- Carolina Swamp Snake
- Northern Brown Snake
- Red-bellied Snake
- Eastern Earth Snake
- Rough Earth Snake
- Southern Ringneck Snake
- Eastern Worm Snake
- Southeastern Crowned Snake
- Glossy Water Snake

*NORTHERN BROWN SNAKE – *Storeria d. dekayi* and
MIDLAND BROWN SNAKE – *Storeria d. wrightorum*

Locally uncommon to common. This species is found in a diversity of habitats from moist to dry woodlands to swampy areas if abundant ground cover and litter are available. Populations are frequently encountered in debris-covered sections of urbanized areas. This species is seldom more than 1 ft long; its general appearance varies from a soft brown or gray to dark brown; its belly is much lighter in color. The two subspecies intergrade throughout the state.

*RED-BELLIED SNAKE – *Storeria o. occipitomaculata*

Locally uncommon. This species is primarily associated with moist woodland areas with abundant ground litter. It is slender and seldom reaches a length of 1 ft. Its back is usually solid brown, dark or light, and the belly is some shade of red. Found throughout the state.

*EASTERN GARTER SNAKE – *Thamnophis s. sirtalis*

Uncommon to common. This species is found in a diversity of habitats that are usually wet or damp, although not necessarily near permanently aquatic areas. It is usually less than 2 ft long but occasionally reaches lengths greater than 3 ft. It is distinguished from all other South Carolina species except ribbon snakes by the presence of 3 yellow stripes down a dark body; its belly is white or light yellow. Found throughout the state.

*EASTERN RIBBON SNAKE – *Thamnophis s. sauritus* and
PENINSULA RIBBON SNAKE – *Thamnophis s. sackeni*

Locally uncommon to abundant. Usually found near aquatic areas, particularly along lake or swamp margins. It is more slender than the previously described garter snake, but it is otherwise similar in general appearance. *T. s. sauritus* is found throughout the state except for extreme southern tip where *T. s. sackeni* is found.

*EASTERN EARTH SNAKE – *Virginia v. valeriae*

Uncommon. This species is usually associated with deciduous woods or cut-over areas with abundant ground litter. It is extremely secretive. Seldom reaching lengths of 1 ft, specimens are nondescript brown or gray dorsally with light bellies. Found throughout the state.

ROUGH EARTH SNAKE – *Virginia striatula*

Uncommon. This species is found in woodlands or areas having abundant ground litter and debris. It is similar in size and general appearance to the eastern earth snake mentioned above. Occurs in the southeastern two-thirds of the state.

*EASTERN HOGNOSE SNAKE – *Heterodon platyrhinos*

Common. This species is characteristically found in sandy habitats including abandoned old fields and scrub oak forests. It often reaches 2 ft in length but seldom 3 ft. Color varies from solid, slate-gray with a light belly to all combinations of yellow, brown, dull red, or green with gray; the color pattern is highly variable. Found throughout the state.

*SOUTHERN HOGNOSE SNAKE – *Heterodon simus*

Uncommon. This species is found in similar habitats as eastern hognose: sandy fields and wooded areas. Seldom more than 2 ft long. The color is usually light brown with darker blotches. Found in the southeastern half of the state.

*SOUTHERN RINGNECK SNAKE – *Diadophis p. punctatus*

Uncommon to common. This species is restricted to moist, though not aquatic, environments, particularly pine or deciduous woodlands with heavy ground litter. It is a highly secretive species. Lengths of slightly more than 1 ft are often attained. The dorsal color is dark or slate gray with a yellow ring around the neck; the belly is yellow to orange with row of dark spots. Found throughout the state with exception of northwestern corner which is occupied by *D. p. edwardsi.*

EASTERN WORM SNAKE – *Carphophis a. amoenus*

Uncommon. This highly fossorial species is found in moist soil with decaying wood or heavy ground litter and is probably restricted to woodlands. Individuals seldom reach lengths of 1 ft. The back is brown and the belly pinkish. Found throughout the state.

PINE WOODS SNAKE – *Rhadinaea flavilata*

Rare to uncommon. This secretive species is seemingly restricted to moist wooded areas, particularly in association with pine forests having abundant rotting logs and vegetation. Specimens are usually less than 1 ft long. The body is brownish with a darker line passing through eye; the belly is light in color. Confined to coastal region in South Carolina.

*EASTERN MUD SNAKE – *Farancia a. abacura*

Uncommon. This species is primarily associated with swamp systems and is always in the vicinity of aquatic habitats. Individuals are heavy-bodied and often attain lengths greater than 4 ft. The back is shiny black or dark gray, and the belly is checkerboard red and black. Found in the southeastern half of the state.

*RAINBOW SNAKE – *Farancia e. erytrogramma*

Uncommon. This species is found in or around aquatic habitats, particularly in cypress swamps. Specimens are heavy-bodied and frequently more than 3 or 4 ft long. It is the only South Carolina snake with a shiny black back and red stripes; the belly is yellow and red with rows of black spots. Found in the southeastern half of the state.

*SOUTHERN BLACK RACER – *Coluber constrictor priapus* and NORTHERN BLACK RACER – *Coluber c. constrictor*

Abundant. This species is found in a wide diversity of habitats and is particularly common in abandoned old fields, pine woods, and hardwood areas. Racers are frequently seen crossing highways during daylight hours. Adults are usually slender snakes 3 to 5 ft long and are black or dark gray all over except for a white chin. *C. c. priapus* is found in the southern half of the state; the northern half of state is occupied by *C. c. constrictor.*

*EASTERN COACHWHIP – *Masticophis f. flagellum*

Uncommon. This species is primarily associated with dry, sandy habitats such as abandoned old fields, scrub oak forests, and sand dune areas; it may occur in pine or hardwood areas on occasion. Adults are slender, but frequently very long, often 5 to 7 ft. The unique adult color pattern is one of grading from black on the head and anterior portion into a straw-colored tail. Found throughout the state except for the northwestern portion.

*ROUGH GREEN SNAKE – *Opheodrys aestivus*

Uncommon. This species is associated with thickly vegetated areas having vines, bushes, shrubs, etc., primarily arboreal. Adults are very slender and seldom reach lengths over 2 ft. This is the only "green" snake in South Carolina. The belly is light yellow. Found throughout the state.

*CORN SNAKE – *Elaphe g. guttata*

Common. This species is generally associated with woodland habitats, including pine and hardwood areas. The usual adult length is 3 to 4 ft. Color pattern consists of a dorsal color of red or orange blotches and a light belly with black squares. Found throughout the state.

*BLACK RAT SNAKE – *Elaphe o. obsoleta* and YELLOW RAT SNAKE – *Elaphe obsoleta quadrivittata*

Common. This species is found in wide variety of habitats including salt marshes but is most common in wooded or swamp areas. Adults frequently attain lengths of more than 4 ft. Coastal forms are olive with 4 dark stripes on the back. Inland specimens are light gray or brown with darker blotches and have a light belly with dark blotches. *E. o. quadrivittata* is restricted to the coastal zone; *E. o. obsoleta* occurs throughout remainder of state.

*NORTHERN PINE SNAKE – *Pituophis m. melanoleucus* and FLORIDA PINE SNAKE – *Pituophis m. mugitus*

Uncommon. This species is restricted to sandy habitats whether abandoned old fields, scrub oak, or pine forests. Adults frequently reach lengths of 4 to 5 ft. The dorsal color is whitish or light gray with black blotches; the belly is plain white or gray. This species ranges over entire state; *P. m. mugitus* is confined to the southern tip.

*EASTERN KINGSNAKE – *Lampropeltis g. getulus*

Common. This species occurs in a wide variety of habitats. Although the species is terrestrial, it is often found in the vicinity of permanent or temporary aquatic areas. Adults usually reach lengths of 3 to 4 ft. The color is black with light yellow crossbands; the belly is a combination of black and yellow. Found throughout the state.

*SCARLET KINGSNAKE – *Lampropeltis triangulum elapsoides* and NORTHERN MILK SNAKE – *Lampropeltis t. triangulum*

Rare. This species is restricted to wooded areas, pine, or hardwood. Adults are usually only slightly more than 1 ft long. Red, yellow, and black rings encircle the entire body. The narrow black rings alternate with narrow yellow and wide red rings. The tip of the nose is usually red. The species is found throughout the state; *L. t. triangulum* occupies the northwestern corner of the state.

MOLE SNAKE – *Lampropeltis calligaster rhombomaculata*

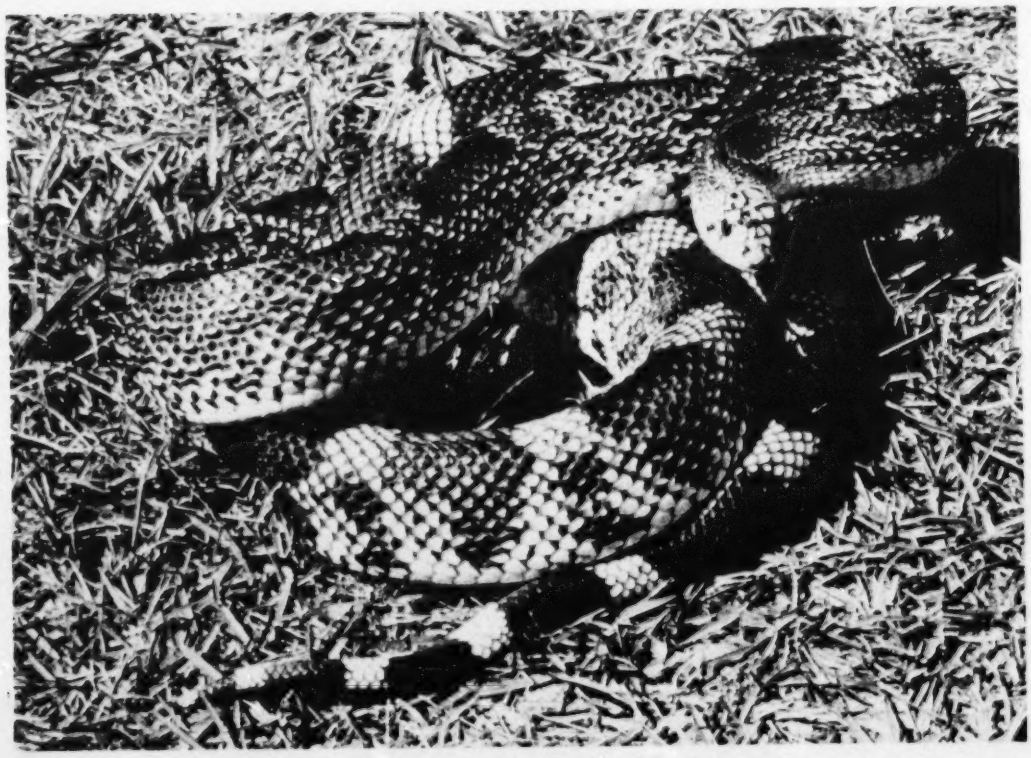
Rare. This poorly known, fossorial species is presumably restricted to areas of soft soil including abandoned or cultivated fields. Adults usually reach 3 ft and are light brown or pinkish in dorsal color with darker brown blotches. Presumably found throughout the entire state, but is reported from scattered localities.

*NORTHERN SCARLET SNAKE – *Cemophora coccinea copei*

Uncommon. This species is characteristically associated with sandy soil habitats including pine woods, scrub oak forests, and abandoned old fields. Adults are slightly over 1 ft long but seldom as much as 2 ft. Typical specimens have red, yellow (or whitish), and black rings similar in size and position to those of scarlet kingsnakes but the rings do not encircle the body. The belly is dull white, and the nose is pointed and always red. Found throughout the entire state.

*SOUTHEASTERN CROWNED SNAKE – *Tantilla coronata*

Uncommon. Found in a variety of habitats but mostly in wooded areas with abundant ground litter and debris. These highly secretive snakes seldom reach 1 ft in length. The back is light brown and the front portion of the head is black, followed by light brown and black band; the belly is light in color. Found throughout the state.



Northern Pine Snake – One of several species of large terrestrial snakes of South Carolina, the northern pine snake presents a formidable appearance but is harmless to humans. Most species in this category will bite but, being nonpoisonous, their maximum effect is usually no more than a scratch. The following are nonpoisonous SRP species that reach lengths of four feet or more: Southern Black Racer, Eastern Coachwhip, Corn Snake, Black Rat Snake, and Eastern Kingsnake.

TABLE 4. Quick Identification Characters to Determine if a Specimen Belongs to a Poisonous Species

A snake from this region is definitely **poisonous** if it has any one of the following characteristics:

1. Fangs – (Picture p. 23)
2. Rattles or a button.
3. An elliptical eye pupil
4. A single row of scales on the underside of the tail
5. An opening (pit) on each side between eye and nostril (Picture p. 23)
6. Red, yellow and black rings encircling the body with the red and yellow rings adjacent

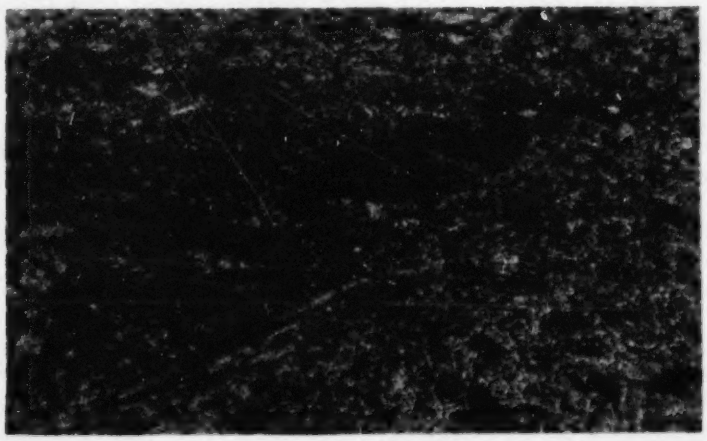
A specimen cannot be designated as **poisonous or harmless** solely on the basis of any **one** of the following characteristics:

1. Visible teeth
2. Vibrating tail when disturbed
3. A round eye pupil
4. A double row of scales on underside of tail
5. Triangular head shape
6. Diamond-shaped patterns on back

FAMILY ELAPIDAE – POISONOUS

*EASTERN CORAL SNAKE – *Micrurus f. fulvius*

Rare. This species has been found in association with a wide variety of terrestrial habitats including wooded areas, fields, and margins of aquatic areas. Adults are about 2 ft in length. Red, yellow, and black rings encircle the body. The narrow yellow rings alternate with red and black rings. The front end of the head is always black, followed by wide yellow band. Found throughout the southeastern half of South Carolina.



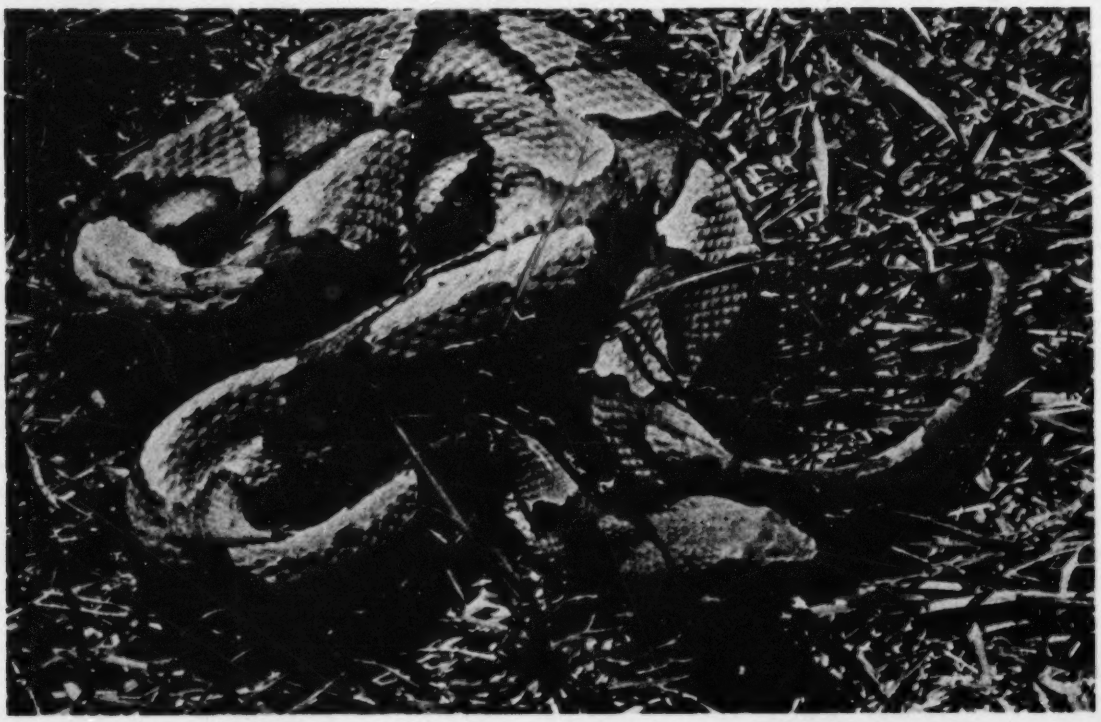
Eastern Coral Snake – Rare throughout South Carolina, the coral snake deserves mention only because of its uniqueness. As the only native member of the cobra family east of the Mississippi River, this species is, drop for drop, in a venom class all its own. But, because of small size, infrequent occurrence, and perhaps even timidity, the coral snake's record hardly ranks with those of other dangerous snakes of the eastern U.S. In fact, during a 41 year period, no deaths from coral snake bites were recorded in South Carolina (McCollough and Gennaro, 1963). Yet, the potential seriousness of a bite from this species warrants a universal warning by parents to their children never to pick up a snake, no matter how pretty, in this region without an adult's assurance of its safety.

Fewer than a dozen coral snakes have been reported from the SRP. One of these was found on Road 1-A about 1 mile east of the Administration Area, another came from New Ellenton, and a third came from the Aiken barricade on SRP Road 2. Because of their burrowing habits, coral snakes are probably more common in certain areas than is apparent.

FAMILY VIPERIDAE – ALL POISONOUS

***SOUTHERN COPPERHEAD** – *Agkistrodon c. contortrix* and **NORTHERN COPPERHEAD** – *Agkistrodon c. mokasen*

Uncommon. This species is usually found in wet wooded areas or high ground areas in swamps, although it may be encountered occasionally in most terrestrial habitats. Adults are generally 2 to 3 ft long. Their general appearance is light brown or pinkish with darker, saddle-shaped cross-bands. The head is solid brown. This species is found throughout state; the northwestern half of the state is occupied by *A. c. mokasen.*

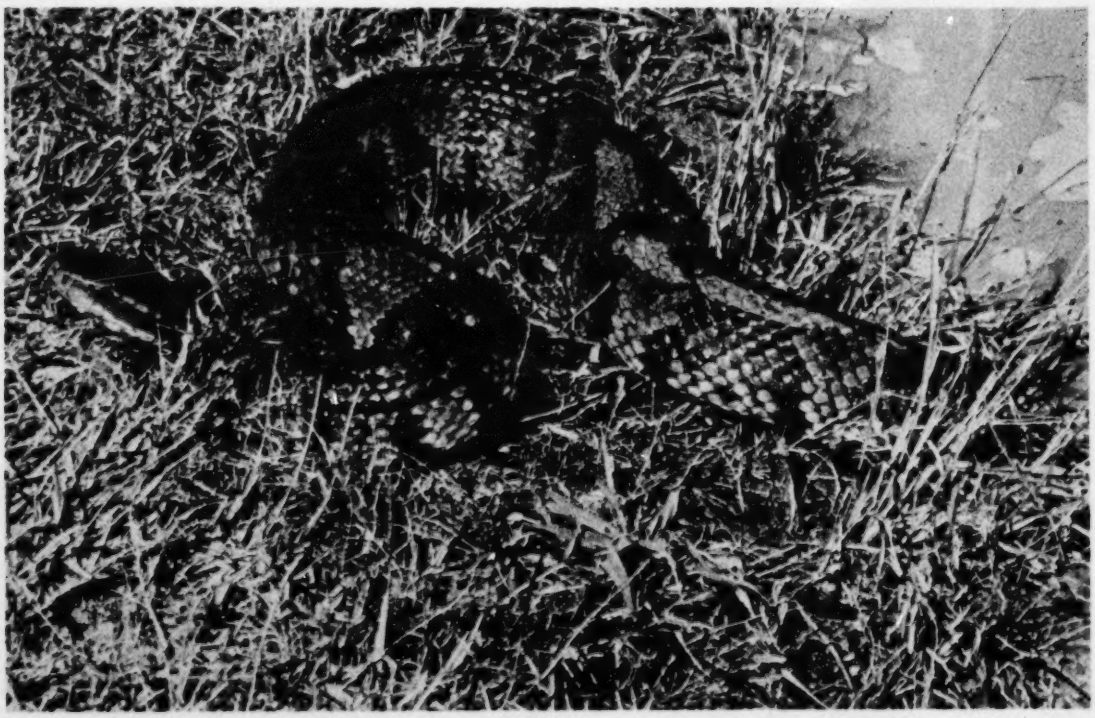


Southern Copperhead– Copperheads have been collected in most habitats on the SRP including hardwood, swamp forest, and mixed pine-hardwood areas. They are primarily terrestrial but are often found in the vicinity of water. In contrast to cottonmouths, copperheads have not been found in heavy concentrations on the SRP, although they frequently have been in other regions, particularly in the mountains. On the SRP, copperheads are usually nocturnal and the majority of specimens have been picked up on SRP highways at night.

Although less venomous than a similar-sized rattlesnake or cottonmouth, the copperhead is quick to bite once a person moves within striking distance, whether intentionally or not. Also, the camouflage potential of a brown and copper snake coiled among the leaves of late fall can often result in an outdoorsman's unwitting entry into the copperhead's strike range. Needless to say, if copperheads are known to be common in an area, the first order of safety is to watch carefully what one steps on, sits on, or picks up.

*EASTERN COTTONMOUTH – *Agkistrodon p. piscivorus*

Abundant. This species is found in association with every type of wet habitat including estuaries, tidal creeks, and salt marshes; although aquatic areas are generally nearby, this species often wanders overland. Adults reach lengths of 3 to 4 ft and are often heavy-bodied. The color pattern is variable, but dorsal colors of adults are usually drab brown or olive with darker crossbands; the belly is a combination of dull yellow and brown, and the underside of tail usually black. Found in the southeastern two-thirds of the state.



Eastern Cottonmouth -- Cottonmouths are almost invariably associated with aquatic habitats although they may wander several yards from the water itself. Within their habitat type this species is unquestionably the most common venomous species on the SRP and throughout the southeastern half of the state. Their swamp-color camouflage and sluggish, slow-to-retreat, manner in many instances make them an easy-to-step-upon snake for the incautious. Cottonmouths are primarily active at night but, ironically, are more likely to be stepped on during the day because of their habit of coiling inconspicuously almost anywhere in the habitat--alongside a cypress knee, on a log, in the grass. If disturbed, the cottonmouth will often stand its ground and give an open-mouthed threat display. Obviously if the snake is seen, the human trespasser is well warned of the danger.

Several nonpoisonous varieties of water snakes inhabit the same environments as cottonmouths. But all of them, no matter how formidable looking or how similar in appearance to the cottonmouth, will immediately retreat to the water when encountered. Cottonmouths occasionally enter the water when startled but, in contrast to water snakes, will usually swim on the surface rather than submerge.

On the SRP, cottonmouths occur in heavy concentrations in many aquatic locations including the Savannah River swamp, farm ponds, Carolina bays, and the natural streams. The Par Pond reservoir system presents something of an enigma, however, in that no resident cottonmouths have been found in several years of field research during both night and day. The answer seems to be that the abundance of alligators and large-mouth bass in the reservoir assures that the survival probability of a fearless, surface swimming snake is exceedingly low.

*CAROLINA PYGMY RATTLESNAKE – *Sistrurus m. miliarius* and DUSKY PYGMY RATTLESNAKE – *Sistrurus m. barbouri*

Uncommon. This species may occur in association with wet areas in wooded habitats or swamps and is often encountered in scrub oak – longleaf pine forest habitats or other wooded sites in noncoastal areas. Individuals are heavy-bodied, but usually only slightly more than 1 ft long. The general color is dull gray with dark gray or brown blotches on back and sides; Small rattles occur on the end of the tail. This species is found over entire state except the northwestern corner; *S. m. barbouri* is confined to the extreme southern tip of the state.

Carolina Pygmy Rattlesnake – Next to the coral snake the pygmy rattler is the most infrequently seen poisonuous snake on the SRP. Isolated specimens are occasionally found, mostly from mixed pine-hardwood areas. The small size diminishes the ultimate threat of these frequently ill-tempered snakes, but serious bites have occasionally been reported. The tiny rattles, proportionately smaller than those of a young canebrake, are ineffectual as a warning signal in most instances. The small fangs would not likely penetrate a typical hunting boot.

***CANEBRAKE RATTLESNAKE** – *Crotalus horridus atricaudatus* **and TIMBER RATTLESNAKE** – *Crotalus h. horridus*

Common. This species occupies a wide diversity of terrestrial habitats, but is found most frequently in deciduous forests and high ground in swamps. Heavy-bodied adults are usually 3 to 4, and occasionally 5, ft long. The basic color is gray with black crossbands which are usually chevron-shaped. The last few inches of the tail is solid black with rattles. This species ranges over the entire state; *C. h. horridus* is found in northwestern one-third of the state.

Canebrake Rattlesnake — The most formidable of the SRP pit-vipers in appearance may indeed be the most docile in behavior. Canebrake rattlesnakes of this region do not characteristically rattle or strike if approached in a slow, easy manner. If restrained, however, canebrakes will strike at their offender if given a chance, and the whirring rattles of a large one can be heard several yards away.

Large canebrake rattlers have been encountered in almost every habitat and in every sector of the SRP. Despite its ubiquity, the canebrake rattler is seldom abundant in a particular, localized area at any given time of the year. Hibernation dens where large numbers congregate conspicuously are rarely found in the nonmountainous terrain of the South Carolina coastal plain. Thus, although the canebrake rattlesnake is one of the most frequently seen snakes on SRP highways, concentrations are seldom found.

Canebrakes are one of the last species to emerge in the spring, with few individuals appearing before May, and one of the last to cease activity in the fall. Individuals are frequently seen on SRP roads in October and occasionally in November.

EASTERN DIAMONDBACK RATTLESNAKE – *Crotalus adamanteus*

This species is found in both wet and dry terrestrial habitats including palmetto stands, pine woods, and swamp margins. Adults are frequently 3 to 5 ft long and occasionally are more than 6 ft long. The basic color is light to dark brown with distinct diamonds of a combination of brown and yellow; the tip of the tail is solid black with rattles. It is found in the southeastern one-third of the state.

Eastern Diamondback Rattlesnake – The most impressive of all South Carolina snakes, the diamondback, is primarily a coastal region species in the State and has not been found on the SRP. The nearest populations may occur within 50 miles of the SRP's southern border.

FACTORS INVOLVED IN POISONOUS SNAKEBITE

A person's chances of receiving a dangerous snakebite in the United States are rare. But the chance always exists, particularly in South Carolina. Five steps can be identified which lead to a possibly serious snakebite. Careful consideration of each may be helpful in dispelling myth and rumor about poisonous snakebite as well as in indicating points at which a person has some control over his fate. Furthermore, selected sets of facts and statistics provide an indication of what an individual's chances of serious injury or death may be as a consequence of being bitten by a poisonous snake in North America.

Step I. Probability of Encounter

Most habitats in nonurban areas of South Carolina have at least a few snake species which are commonly seen. It is a near certainty that people who take frequent trips to wooded areas, lakes, streams, or rivers during the warmer months in this state will eventually encounter some species of snake.

Many different environmental factors influence the activity levels of different species. Temperature is the singlemost important factor affecting snakes and most other reptiles. For this reason, a warm spell in February can result in the appearance of several South Carolina snake species, whereas a cool period in late April can inhibit their activity. Time of day is also important, although the exact relationship with above-ground activity is not clearly understood.

Rainfall probably stimulates activity in some situations; however, its influence is difficult to assess, and no hard and fast rule can be set forth. Unfortunately our lack of knowledge and understanding about the habits and general ecology of most snake species provides us with little in the way of predictability about how a given species will respond to particular conditions of season, weather, and location. However, a reliable statement can be made that one has a high chance of ultimately encountering a snake in natural habitats in South Carolina.

The factors discussed in the following paragraphs are known to affect activity of snakes in some situations:

Temperature. Most reptiles, particularly snakes, are rendered helpless as environmental temperatures approach freezing. Below temperatures of 50 to 55 F, most poisonous snakes, if seen above the ground at all, will be moderately inactive. Unfortunately, the rule does not hold true for 100% of the cases. A snake may be warmer than its surroundings due to basking in the sun or recent emergence from warmer-than-air water. But, in a general sense, cool weather means fewer snakes will appear and those that do will be less active.

Season. The seasonal trends in snake activity partly reflect temperature, but other factors are apparently involved also. As far as we know, all species of South Carolina snakes are reproductively most active during the spring months of March, April, and May. This mate-seeking period is the one of greatest activity by most snake species, and most species are seen less frequently after the spring peak. But during the summer months, no matter what the weather conditions, there is some possibility in South Carolina of encountering any species.

For some species, such as the hognose snakes and canebrake rattlers, a fall activity peak also occurs, usually in September or early October. Occasional specimens are seen on warm days in November, but during December, January, and February, snake activity is practically nonexistent in these areas except for unusually long spells of warm weather. A sampling of SRP snakes from road captures indicates seasonal activity patterns of some species (see FIG 2).

Time of Day. Many species of snakes have preferential times of activity, whereas others can be found at almost any time of day or night. A few species deserve mention because of their predictability. For example, black racers, coachwhips, and hognose snakes are never active after dark. They can be categorically classed as strictly diurnal. In contrast, scarlet snakes, and striped water snakes are almost exclusively nocturnal, usually between sundown and midnight. Most species are not completely restricted to a particular time of day although most of their activity may be. The following list indicates the daily activity patterns of some SRP species for which information is available.

Activity Period	Species
Primarily late afternoon, early evening	Canebrake Rattlesnake
Primarily daytime	Eastern Hognose Snake
	Southern Hognose Snake
	Southern Black Racer
	Eastern Coachwhip
	Florida Pine Snake
	Eastern Kingsnake
Primarily nighttime	Florida Green Water Snake
	Eastern Glossy Snake
	Eastern Mud Snake
	Corn Snake
	Northern Scarlet Snake
	Eastern Cottonmouth

It should be kept in mind that, although a poisonous species may be primarily a night crawler, some individuals do move around during the day. Also, inactive specimens have to stay somewhere, even if it is merely coiled beside a log.

Rainfall. A heavy rain in some parts of Florida will invariably bring out numerous snakes, particularly at night. This phenomenon apparently does not occur on the SRP, although it is true for salamanders and frogs. Except for undetermined subtle effects, rainfall has no apparent direct effect on activity of snakes on the SRP and hence on the chances of a person encountering a poisonous snake.

Step II. Probability of the Snake Being Poisonous

Six of the 38 species of snakes in South Carolina are poisonous; however, the different species of both types vary considerably in their commonness or rarity. Because of the high number of uncontrolled variables involved, no standard set of rules can be set forth to allow a probability statement about the chance of a trod-upon snake being poisonous or nonpoisonous. For example, as indicated above, season of the year, locality within the state, type of habitat, time of day, and weather conditions all influence what species of snake is likely to be encountered. Some facts which may indicate relative abundance, however, are the proportion of species in preserved scientific collections within the state as well as selected sets of data from studies on SRP. Both, unfortunately, suffer from certain biases because rare or otherwise interesting species (such as rattlesnakes) are more likely to be noted and collected, whereas common forms such as black racers or water snakes may not be as noteworthy and as well represented as they actually are in nature.

One indication of commonness is information based on systematic road cruises conducted at the SRP. In two studies of this type (one in 1965 and one in 1976), a route was selected which passed through all of the representative habitats of the area. The route was patrolled throughout the active season, at all times of the day and night, and under different weather conditions. Although biased in certain regards, these censuses indicate the presence and relative abundance of species which frequently travel overland. The findings from the two studies are indicated in FIG 2.

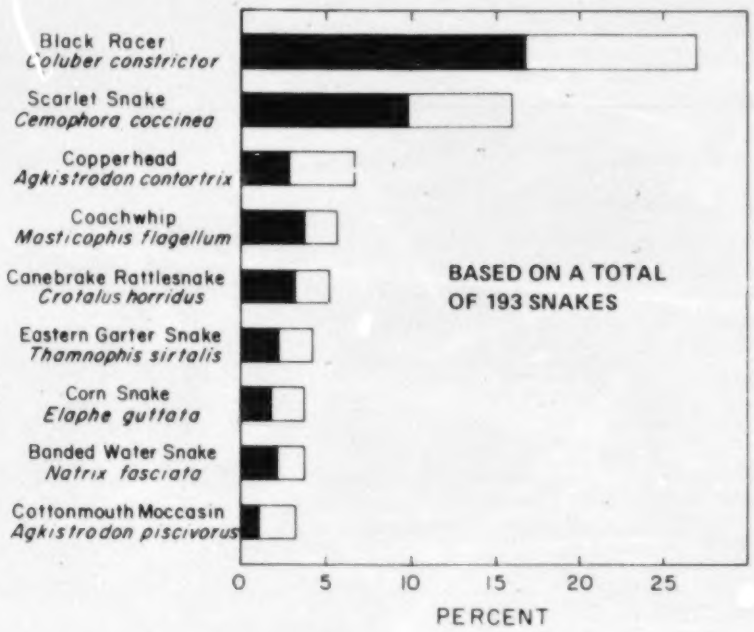


FIG 2. *Relative abundance of snakes collected crossing highways of the Savannah River Plant by Duever* in 1965 (N = 110; black bars) and by Buie† in 1976 (N = 83; open bars). Sampling of this type tends to emphasize the presence of large, active species that are likely to move long distances.*

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* *M. J. Duever. "Distribution in space and time of reptiles on the Savannah River Plant in South Carolina." Unpubl. M. S. Thesis, University of Georgia, Athens, Georgia (1976).*

† *D. Buie and I. L. Brisbin, Jr. "Baseline studies of selected vertebrates of the Savannah River Plant." In Preparation.*

Step III. Probability of Being Bitten by a Poisonous Snake After Encounter

Many snakebites occur after an individual has seen the snake that will ultimately bite him and while the accident can still be avoided. So, a first step in dealing with a snake in any capacity is to treat it as poisonous until you have a confirmed identification. If you are not absolutely positive of the species, let it alone completely. Killing a snake in an uninhabited area does little to reduce the snake population size and only increases a person's chances of being bitten. Many snakebites result from a lack of respect for a small snake which may be encountered. Frequently the victims are children. But many are adults who pick up specimens because they think they know how to do so without being bitten. Some snakebites occur from snakes which were thought to be dead or nonpoisonous and were picked up by unwary persons. The possibilities of accidentally being bitten by an unseen snake are very real, but to be bitten after you have seen the animal is inexcusable. All indications are that a thinking adult has a minimal chance of being bitten by a poisonous snake in South Carolina.

Step IV. Probability of the Bite Being Dangerous

One of the least predictable features of poisonous snakebite is the seriousness of a bite immediately after the victim is struck. Table 5 shows the range of variability in effects which have been reported for actual cases of poisonous snakebite. The first category indicates that one-fourth of the venomous snakebites are, for all practical purposes, harmless! They cause absolutely no medically treatable effects! In fact, approximately 2/3 of the snakebite victims in North America show little or no effect from being bitten. At the other end of the spectrum, however, greater than 10% of the cases could result in serious consequences, such as loss of feeling in a limb, amputation, or even death if proper treatment is not administered. After being bitten, however, one does not know how serious the bite actually is. An encouraging fact is that in recent years fewer than 1 in 500 people bitten in this country have actually died from poisonous snakebites.

Some variables are more dependable than others in estimating an individual's probability of having received a serious bite. Obviously, a large diamondback is to be more feared than a small copperhead since no deaths from the copperhead have been recorded in the United States in the last 25 years. But, suppose the rattlesnake had recently killed two rabbits for a meal so that its venom supply was greatly reduced. Or, if only one fang penetrated the skin, the venom dose would be only one-half. On the other hand, if a copperhead sunk both fangs right in the center of a major artery, the effects might be immediate and severe. Unfortunately, we seldom have information of this type when the snake bites his victim. Furthermore, a person is not likely to have a firm knowledge of his own physiological condition in terms of his body's response to an injection of venom. Uncertainties such as these always leave the seriousness of the bite in doubt.

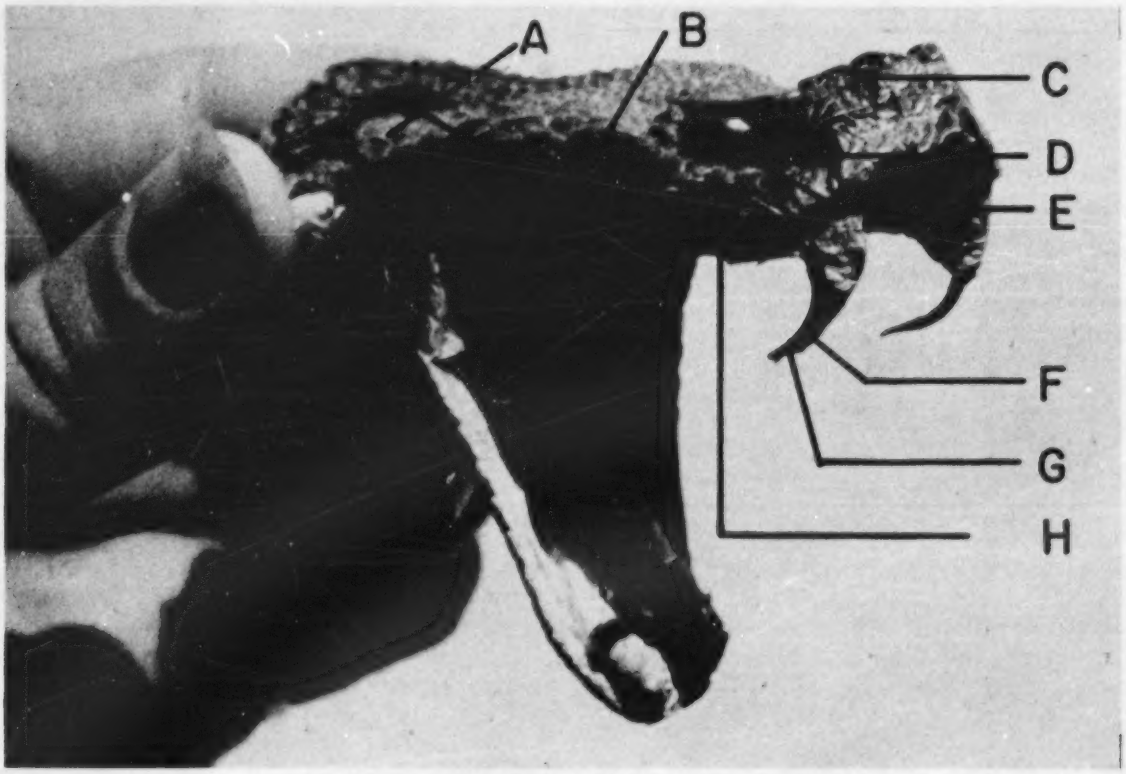
TABLE 5. An indication of the probability of a South Carolina snakebite being serious is given below. A collection of more than 1300 case histories from mostly southern states reveals that the majority of pit-viper bites result in minimal or no effect to the victim.*

Level of Venenation (introduction of venom into body)	*Symptoms*	*Recommended Medical Treatment*	*Percentage of Sample*
None	Fang marks, but little or no pain	None	25
Slight	Slight swelling and pain	Minimal; usually no anti-venin required	38
Moderate	Pain, swelling, possible nausea, symptoms of shock	Medical attention necessary with administration of anti-venin	22
Severe	Increased intensity of pain, swelling, and other symptoms; possible unconsciousness in later stages	Medical attention essential; high levels of anti-venin	14

* Table adapted from (1) H. M. Parrish, J. C. Goldner, and S. I. Silberg, 1966. Poisonous snakebites causing no venenation. *Postgraduate Medicine 39* (3): 265-269 and from (2) L. H. S. Van Mierop, 1976. Poisonous snakebite: A review. 2. Symptomatology and treatment.

Pit Viper Head – The head of a canebrake rattlesnake is used to demonstrate the mechanism by which venom is administered to a victim. Poison glands (A) are located on either side of the head. On a large rattlesnake these may contain several cc of venom at any one time. As a result of the impact and pressure from biting a victim, poison is forced from the sacs through venom ducts (B) into the hollow fangs (F). An opening (G) in the tip of the fangs allows the system to operate in the same manner as a hypodermic syringe. The dotted line (H) indicates the position of the movable fangs when the mouth is closed. Pit-vipers usually have a series of replacement fangs which move into position, one at a time on either side, if a fang is damaged or removed. In contrast, the fangs of coral snakes are considerably smaller and more or less permanently fixed in position in the front of the mouth.

The heat-sensitive "pit" (D) of a pit-viper is located slightly below a line drawn from eye (E) to nostril (C).



Step V. Probability of Receiving Improper Treatment

The treatment of poisonous snakebite is one of the major determinants of the ultimate seriousness. Improper treatment of the bite of a small pit-viper can easily lead to more serious medical complications than undertreatment of the bite of a moderate sized one. The issue of proper treatment is debated among physicians and not likely to be resolved here. However, some medical facts make certain recommendations appear reasonably unquestionable. Most medical authorities agree categorically on the following points:

DO NOT DO THE FOLLOWING:

Do not drink or eat anything, including alcoholic beverages, stimulants, or medicine!

Do not run or unnecessarily exert oneself physically!

DO THE FOLLOWING:

Do get the victim to a hospital or local medical doctor as expeditiously as possible!

From this point on, what constitutes proper first-aid and medical treatment is not agreed upon by different medical authorities with snakebite experience.

The following aspects of poisonous snakebite treatment must be considered, particularly by the victim who must make a decision about what to do: **Incision and suction, use of constriction band, artificial cooling, use of anti-venin in the field.**

Each of these can be best assessed through the cost/benefit model indicated in Table 6.

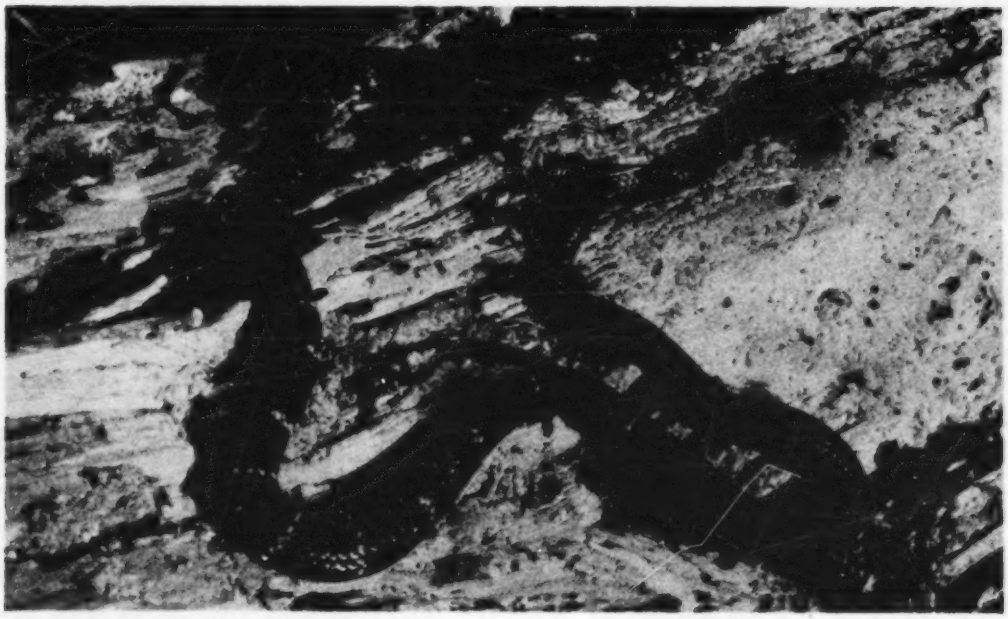
TABLE 6. Cost/Benefit Comparison of Controversial First-Aid Treatments* for North American Poisonous Snakebites

			Recommendations	
First-Aid Treatment	*Possible Benefits*	*Possible Cost*	*Professional Medical Assistance Available Within 1 Hour*	*Victim to be Isolated From Medical Services For Extended Time Period*
Incision and suction	Removal of venom	Infection, excessive bleeding, cutting of critical vein, artery, nerve, or tendon	No action	Careful cutting with sterile blade in vicinity of bite within minutes after being bitten: begin sterile suction immediately for up to 1/2 hour
Constriction band	Retards movement of poison through body	Concentrates poison in unfavorable local area: restriction of normal circulation	No action	Light constriction frequently removed
Cooling	Reduces pain and swelling: neutralizes some poisons: retards movement of poison through body	Concentrates poison in unfavorable local area: cell damage from continued low temperatures	No action	Limited use to lessen pain
Anti-venin administration (self-administered in field without medical guidance)	Neutralizes poison	Infection; anti-phylactic shock: other reactions	No action	Careful administration under sterile conditions

* What constitutes proper first-aid treatment of snakebite is a highly controversial subject of debate among physicians. One reason that a clear, unequivocal medical statement cannot be made is that the effects of the bite can be so variable (see Table 5). The above recommendations are based on the impact that an "average" snakebite would have on a healthy individual.

Children Must be Taught Snake Safety – Many snakes are harmless and can even be enjoyed as pets in some instances,

but . . .
in South Carolina any chance encounter may be a dangerous one. Children should be taught never to pick up a chanced-upon snake, no matter where (backyard, old field, or swamp) or how certain they are of what kind it is. The consequences of a mistake are too great in South Carolina



USEFUL REFERENCES

Specialty journals in herpetology occasionally have particular articles pertinent to a region, although these are designed for the professional or serious amateur. A variety of general references are available which may be appealing to someone interested in an extensive understanding of the snakes of South Carolina. Selected references are indicated below:

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